



UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER FOR PATENTS
P.O. Box 1450
Alexandria, Virginia 22313-1450
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/779,781	02/18/2004	Ji-Yong Park	6161.0111.US	1632
58027 7590 12/19/2006 H.C. PARK & ASSOCIATES, PLC 8500 LEESBURG PIKE SUITE 7500 VIENNA, VA 22182			EXAMINER LANDAU, MATTHEW C	
			ART UNIT	PAPER NUMBER
			2815	
SHORTENED STATUTORY PERIOD OF RESPONSE		MAIL DATE	DELIVERY MODE	
3 MONTHS		12/19/2006	PAPER	

Please find below and/or attached an Office communication concerning this application or proceeding.

If NO period for reply is specified above, the maximum statutory period will apply and will expire 6 MONTHS from the mailing date of this communication.

31

Office Action Summary

Application No.

10/779,781

Applicant(s)

PARK ET AL.

Examiner

Matthew Landau

Art Unit

2815

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 04 December 2006.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 2-47 is/are pending in the application.
- 4a) Of the above claim(s) 2,5-7,9-12 and 14-46 is/are withdrawn from consideration.
- 5) ☒ Claim(s) 3,4,8 and 13 is/are allowed.
- 6) ☒ Claim(s) 47 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
 - ☐ Certified copies of the priority documents have been received in Application No. _____.
 - ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08)
Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____ |

Art Unit: 2815

DETAILED ACTION

Response to Amendment

Applicant's request for reconsideration of the finality of the rejection of the last Office action is persuasive and, therefore, the finality of that action is withdrawn.

The amendment filed December 4, 2006 has been received and entered.

Election/Restrictions

Claims 2, 5-7, 9-12, and 14-46 are withdrawn from further consideration pursuant to 37 CFR 1.142(b) as being drawn to a nonelected invention/species, there being no allowable generic or linking claim. Election was made **without** traverse during the telephone conversation with Hae-Chan Park (Reg. #50,114) on June 21, 2005, and was confirmed in the reply filed 9/27/2005.

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Claim 47 is rejected under 35 U.S.C. 103(a) as being unpatentable over Nakajima (US Pat. 7,037,779) in view of Zhang.

Regarding claim 47, Figures 14 and 17 of Nakajima discloses an organic electroluminescent device (col. 21, lines 18-22 and 34-36) comprising switching (pixel) TFTs

Art Unit: 2815

504 and driving TFTs (transistors in driving circuit section). Nakajima does not disclose the specific limitations regarding the average number of grain boundaries in the channel regions of the switching and driving TFTs. Figure 3 of Zhang discloses a flat panel display device (liquid crystal display) (col. 1, lines 49-51) comprising: a pixel portion 3 divided by gate lines and data lines (not labeled) and equipped with a thin film transistors (TFT) (col. 1, lines 53-60) driven by signals applied by the gate lines and data lines; and driving circuit portion 2 comprising a TFT (col. 1, lines 53-60) connected to the gate lines and data lines respectively to apply signals to the pixel portion. It is inherent that the average number of grain boundaries in the channel regions of the driving TFTs that meet a current direction line is more than zero, since Zhang does not disclose a crystallization method that would result in grain boundaries being exactly parallel with the current line direction. Furthermore, Zhang discloses a method of crystallizing the amorphous semiconductor film used to make the active (channel) region of the driving and pixel TFTs, wherein the crystallinity of portions used to make the channels of driving TFTs is greater than the crystallinity of the portions used to make the channel of the pixel TFTs, thereby enhancing the carrier mobility of the driving TFTs (col. 3, line 67 – col. 4, line 4, col. 4, lines 14-18 and 35-40, and col. 8, lines 54-62). Since, the channel regions in the driving TFTs have a greater crystallinity, it follows that they have fewer grain boundaries. Therefore, it is inherent that the average number of grain boundaries in the driving TFTs that meet a current direction line is at least one less than the average number grain boundaries in the pixel TFT that meet a current direction line.

In view of such teaching, it would have been obvious to the ordinary artisan at the time the invention was made to modify the invention of Nakajima by including the TFT structures of

Art Unit: 2815

Zhang for the purpose of obtaining low leakage current pixel TFTs and a high current mobility driving TFTs (col. 4, lines 35-40).

Claim 47 is rejected under 35 U.S.C. 103(a) as being unpatentable over Nakajima in view of Miyanaga.

Regarding claim 47, Figures 14 and 17 of Nakajima discloses an organic electroluminescent device (col. 21, lines 18-22 and 34-36) comprising switching (pixel) TFTs 504 and driving TFTs (transistors in driving circuit section). Nakajima does not disclose the specific limitations regarding the average number of grain boundaries in the channel regions of the switching and driving TFTs. Figures 1 and 5F of Miyanaga discloses a flat panel display device (liquid crystal display) comprising: a switching TFT for transmitting data signals; and a driving TFT for driving the display device so that a certain amount of current flows through the device according to the data signals, wherein an average number of grain boundaries of polycrystalline silicon which are formed in active channel regions of the driving TFT and meet a current direction line is more than zero and at least one or more less than the average number of grain boundaries of polycrystalline silicon which are formed in active channel regions of the switching TFT and meet a current direction line for a unit area of active channels. Note that Miyanaga discloses the grain boundaries in the channel of the driving (peripheral) TFT grow in a direction *approximately* parallel with the current direction (col. 2, lines 30-34) and that the grain boundaries in the channel of the pixel (switching) TFT grew in a direction approximately perpendicular to the current direction (col. 2, lines 34-50 and col. 8, lines 42-51). Since the

Art Unit: 2815

crystal grains in the driving TFT are not perfectly parallel to the current direction (which would be impossible due to the somewhat random nature of crystal growth), it is inherent that at least some grain boundaries meet the current direction line. On the other hand, nearly all grain boundaries in the switching TFTs meet the current direction line since they grow approximately perpendicular to the current direction. Therefore, it is inherent that the average number of grain boundaries that meet the current direction in the driving TFTs is more than zero, but at least one less than that of the pixel TFTs.

In view of such teaching, it would have been obvious to the ordinary artisan at the time the invention was made to modify the invention of Nakajima by including the TFT structures taught by Miyanaga. The ordinary artisan would have been motivated to modify Nakajima in the manner described above for the purpose of obtain an organic electroluminescent display wherein the OFF current of the switching TFT is minimized and the current mobility in the driving TFT is increased (col. 8, lines 42-53).

Allowable Subject Matter

Claims 3, 4, 8, and 13 are allowed.

The reasons for allowance were provided in the Office Action mailed on November 7, 2005.

Art Unit: 2815

Response to Arguments

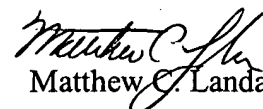
Applicant's arguments with respect to claim 47 have been considered but are moot in view of the new ground(s) of rejection.

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Matthew C. Landau whose telephone number is (571) 272-1731.

The examiner can normally be reached from 8:30 AM - 5:30 PM. If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Kenneth Parker can be reached on (571) 272-2298. The fax phone numbers for the organization where this application or proceeding is assigned are (571) 273-8300 for regular communications and (571) 273-8300 for After Final communications.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should any questions arise regarding access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).


Matthew C. Landau

December 16, 2006